

Claims

1. A winding film of polypropylene copolymer, having a thickness of 30 to 180 μm ,
wherein
5 the force in machine direction at 1% elongation has a value of 0.6 to 4 N/cm and
the force at 100% elongation has a value of 2 to 20 N/cm,
the crystallite melting point of the polypropylene copolymer is less than 166°C,
and
the fraction of flame retardant is at least 40 phr.
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2. The winding film of claim 1, characterized in that
the thickness of the winding film is 50 to 150 μm , in particular 55 to 100 μm ,
the force in machine direction at 1% elongation is 1 to 3 N/cm and/or
the force at 100% elongation is 3 to 10 N/cm.
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3. The winding of claim 1 or 2, characterized in that
the winding film comprises at least one polypropylene copolymer
having a flexural modulus of less than 500 MPa, preferably of 80 or less and more
preferably of 30 MPa or less, and/or
20 having a crystallite melting point of below 148°C, preferably below 145°C, more
preferably in the range from 120°C to 166°C.
4. The winding film of at least one of claims 1 to 3, characterized in that the
polypropylene copolymer is produced in a process in which a PP homopolymer or
25 random PP copolymer is further reacted with ethylene and propylene.
5. The winding film of at least one of the preceding claims, characterized in that it is
free from red phosphorus and preferably the amount of chemically bonded
phosphorus does not exceed 0.5 phr.
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6. The winding film of at least one of the preceding claims, characterized in that the
winding film has on one or both sides, especially one side, a layer of adhesive,
which is preferably based on polyisoprene, ethylene-vinyl acetate copolymer
and/or polyacrylate, and if desired has a primer layer between film and adhesive

layer,

the amount of the adhesive layer being in each case 10 to 40 g/m², preferably 18 to 28 g/m²,

the bond strength to steel being 1.5 to 3 N/cm,

- 5 the unwind force being 1.2 to 6.0 N/cm at 300 mm/min unwind speed, preferably 1.6 to 4.0 N/cm, more preferably 1.8 to 2.5 N/cm, and/or the holding power being more than 150 min.

- 10 7. The winding film of at least one of the preceding claims, characterized in that the winding film comprises a solvent-free pressure-sensitive adhesive which is produced by coextrusion, melt coating or dispersion coating, preferably a pressure-sensitive dispersion adhesive and in particular one based on polyacrylate, this adhesive being joined to the surface of the carrier film by means of flame or corona pretreatment or of an adhesion promoter layer which is applied
15 by coextrusion or coating.

8. The winding film of at least one of the preceding claims, characterized in that the flame-retardant filler is added at 70 to 200 phr, preferably at 110 to 150 phr, in particular a magnesium hydroxide.

- 20 9. The winding film of at least one of the preceding claims, characterized in that the fraction of carbon black is at least 5 phr, preferably at least 10 phr, the carbon black preferably having a pH of 6 to 8.

- 25 10. The winding film of at least one of the preceding claims, characterized in that the winding film is plasticizer-free or the plasticizer content is so low that the fogging number is above 90%.

- 30 11. A process for producing a winding film of at least one of the preceding claims, characterized in that the compounding is performed in a kneader or extruder so thoroughly that the film manufactured from the compound achieves a breakdown voltage of at least 3 kV/100 µm, preferably at least 5 kV/100 µm, the flame-retardant filler is added not all at once when producing the compound,

but instead in at least two portions, and/or
the compound is supplied as a melt without an intermediate stage in solid form to
the operation of film production by extrusion or calendering.

- 5 12. A process for producing a winding film of at least one of the preceding claims, by
calender processing, in which case the melt index of the polypropylene copolymer
is below 5 g/10 min, preferably below 1 g/10 min and in particular below
0.7 g/10 min,
and/or
10 extrusion processing, in which case the melt index of the polypropylene copolymer
is between 1 and 20 g/10 min, in particular between 5 and 15 g/10 min.
13. A process for producing a winding film of at least one of the preceding claims,
characterized in that
- 15 • the winding film is wound to logs, which then, to increase the unwind force,
are heat-treated and subsequently slit into rolls, the unwind force of the
material thus produced at 300 mm/min being higher preferably by at least
50% than without such a measure, or
- 20 • the winding film, for the purpose of increasing the unwind force, is subjected
to a flame or corona treatment or is provided with a polar coextrusion layer
and is subsequently processed into rolls, the unwind force of the material
thus produced at 300 mm/min being higher preferably by at least 50% than
without such a measure, or
- 25 • the winding film is slit by a process which leads, as a result of rough slit
edges, to easier hand tearability, the breaking elongation of the winding-film
rolls thus slit being lower preferably by at least 30% than in the case of slitting
with sharp blades,
- 30 • the winding film is slit by a process which leads, as a result of rough slit
edges, to easier hand tearability, the breaking elongation of the winding-film
rolls thus slit being preferably in the range from 200 to 500%,
- the winding film is slit on an automatic slitter with defined knife advancement
speed,
- the winding film is wound on a core with an inside diameter of 30 to 40 mm,
preferably of board.

14. Use of a winding film of at least one of the preceding claims for bundling, protecting, labeling, insulating or sealing ventilation pipes or wires or cables and for sheathing cable harnesses in vehicles or field coils for picture tubes.